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PATENT

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Applicant	:	Matsuda, et al.
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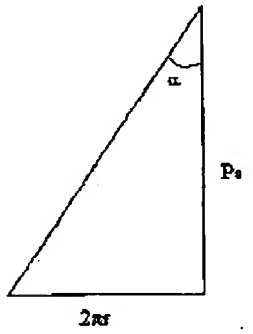
Filed	:	June 12, 2006

I. Clarification is required on the interpretation of Osako (6220983) with respect to the angle of twist.

- The angle of twist α can be calculated as follows:

$\alpha=\tan^{-1}(2\pi r/Ps)$, wherein r is a spiral radius, Ps is a twisting pitch.



In Osako, the diameter (2r) is 1.1 to 1.5 mm, resulting in $2\pi r$=3.46 to 4.71 mm. The final twist number is 5 to 10 twists/10 cm, resulting in Ps=10 to 20 mm. Thus, $\alpha=\tan^{-1}((3.46 \text{ to } 4.71)/(10 \text{ to } 20))=\tan^{-1}(0.173 \text{ to } 0.471)=9.8 \text{ to } 25.2$.

II. The differences between Umezawa (5520233) and the claimed invention need to be discussed.

- The structure (a heavy duty pneumatic tire) requires:

(i) at least one carcass ply containing cords;

(ii) a first belt layer (containing cords inclined at a large cord angle, e.g., 50°, with respect to the equatorial plane of the tire to develop a "propping effect", enhancing the tensile rigidity of the belt); and

(ii) at least two belt layers (each containing cords inclined at a small cord angle, e.g., 20°, with respect to the equatorial plane), in which cords of the second and third belt layers are crossed with each other.

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- The tensile rigidity of the belt is evaluated by the resistance to cord breakage when the internal pressure applied to the tire is reciprocally changed from 1.0 kgf/cm^2 to 7.0 kgf/cm^2 (the shoulder portion of the tire is continuously subjected to input from projections existing on road surface) (col. 6).
- There is no motivation to single out the cords from the above complex structure and place them in a helical synchronous belt (the core cord twist angle is an angle with respect to the longitudinal direction of the belt).